Footwear experiences of people with chronic musculoskeletal diseases

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Objective: Foot pain and deformities are frequently reported by people with chronic musculoskeletal diseases, but only limited research has been conducted to explore the key issues concerning footwear difficulties in this population. The aim of this study was to explore, identify and describe the main issues surrounding the footwear experiences of people with chronic musculoskeletal diseases.

Methods: A qualitative manifest content analysis of open-ended survey responses concerning footwear experiences was conducted from a national footwear survey of people with chronic musculoskeletal diseases in New Zealand. Eighty-five respondents submitted usable responses. Specific statements in the text were identified as 'units of analysis' prior to coding and organisation of these units into emerging mutually-exclusive categories. Content analysis was independently undertaken by three researchers and final categories and coding was achieved through consensus. Frequencies of assigned units of analysis were calculated in order to obtain a quantitative description for each category.

Results: Four categories encompassing a total of nine subcategories related to the footwear experiences of respondents emerged from the qualitative data content analysis including: 1) difficulties in finding appropriate footwear; 2) dissatisfaction with therapeutic footwear provision and foot care access; 3) high costs of footwear, foot care and self-care; and 4) satisfaction with therapeutic footwear and foot care.

Conclusion: Key categories describing the important issues surrounding the footwear experiences of respondents with chronic musculoskeletal diseases were identified which may provide important targets for improving footwear and foot care services, and self-management strategies.

Significance and Innovations

- This study provides new and novel data concerning the footwear experiences of people with less frequently researched chronic musculoskeletal diseases associated with foot pain, impairments and disability.
- Individual level disease-related foot problems, gender, and personal preferences concerning footwear should be considered by clinicians who work with people with chronic musculoskeletal diseases.
- An increased knowledge and awareness amongst clinicians delivering foot care of where and how patients can purchase appropriate shoes could facilitate more effective self-management and reduce the burden experienced by people with chronic musculoskeletal diseases.
- The high levels of costs associated with appropriate footwear and foot care may be significant barriers to improvements in foot-related outcomes, as poor footwear has been associated with foot impairments and disability.

Foot and ankle joint pain, impairment, disability and deformities are frequently reported by people with chronic musculoskeletal diseases such as rheumatoid arthritis (RA) [1,2], osteoarthritis (OA) [3], gout [4], psoriatic arthritis (PsA) [5], juvenile idiopathic arthritis (JIA) [6], systemic lupus erythematosus (SLE) [7], and systemic sclerosis (SSc) [8]. These disease-related foot impairments have been associated with causing difficulty with respect to finding suitable, desirable and comfortable footwear. However the literature is currently dominated by studies focusing predominantly on the perceptions of people with RA, particularly women [9-12].

Several key issues of importance have been highlighted concerning footwear for people with RA including comfort, fit, design/style, breathability, and the impact of therapeutic footwear on perceptions of disease burden and body image in women [9-12]. Qualitative explorations of the footwear difficulties experienced by people with RA have provided valuable sources of information that have helped to improve the knowledge and understanding of the complex issues surrounding footwear amongst clinicians who are responsible for providing therapeutic footwear, footwear advice and foot care. Indeed it is recognised that the provision of therapeutic footwear is effective for reducing foot pain in RA [13], but patients' opinions and perceptions of therapeutic footwear need to be considered to ensure adherence and thus success of the footwear intervention [1,9,13].

In contrast, limited research has been conducted to explore the key issues concerning footwear that are experienced by people with other chronic musculoskeletal diseases. RA typically affects women more than men [14] and often results in widespread large and small joint inflammation [15]; whereas gout typically affects men more than women [16] and often results in a solitary joint flare at the first metatarsophalangeal joint [17]. Therefore it is

reasonable to suggest that the footwear and foot care needs of people who suffer from different chronic musculoskeletal diseases may vary substantially. A recent study of the foot problems experienced by people with gout reported that the use of poor footwear is common and is associated with higher levels of disease-related foot impairments and disability [17]. A recent observational study found that improvements in foot pain and disability levels were achievable with the use of footwear in people with gout with good cushioning and motion control characteristics over an 8 week period [18].

A qualitative study of symptomatic foot OA has recently highlighted the importance of suitable footwear characteristics to female sufferers of this condition [19]. In particular women expressed that footwear and personal appearance were important elements of desirable self-image, arguably similar to previous findings from studies of women with RA [10-12]. Similarly, issues concerning self-image and associated stigma of wearing therapeutic shoes have been highlighted in a qualitative study of the perceived impact of foot problems experienced by children with JIA [20]. Interestingly whilst self-image in relation to footwear was identified as more important to women with JIA, concerns were also expressed by respondents concerning young men experiencing difficulty with finding suitable sports footwear such as football/rugby boots [20].

The aim of this study was to explore, identify and describe the main issues surrounding the footwear experiences of people with chronic musculoskeletal diseases.

MATERIALS AND METHODS

This was a qualitative component of a larger national survey carried out in New Zealand collecting data on footwear experiences of people with chronic musculoskeletal diseases [21].

The study sample was obtained from a population of Arthritis New Zealand members who were registered as having a chronic musculoskeletal disease. For the purposes of this study, each survey participant was invited to respond to an open-ended question on experiences concerning footwear which was worded as follows: 'Do you have any further comments about your footwear experiences?' Of the 185 responses to the larger survey there were 85 (46%) usable responses to the open-ended question. Open-ended responses from each individual respondent were compiled consecutively in an unstructured transcript document. An interpretational manifest content analysis approach was adopted for the analysis of the open-ended responses, in contrast to latent content (embedded or underlying meaning) [22]. Qualitative manifest content analysis focuses on the subjective interpretation of the visible and obvious components of textual data that provide further knowledge and understanding of the phenomenon in question [23,24]. A key aim of the content analysis technique is to attain a condensed and broad description of the phenomenon [22]. For the purpose of this analysis, the phenomenon subject to exploration was 'footwear experiences amongst people with chronic musculoskeletal diseases'. Using this form of content analysis, the objective was to identify specific statements in the text as 'units of analysis' prior to a process of coding and organisation of these units into emerging mutually exclusive categories. We considered 'units of analysis' to be specific statements or sentences from the text that were small enough to be considered as having contextual meaning. A data-driven inductive approach to coding was adopted, where important units of analysis were identified prior to interpretation [25].

Three researchers (GJH, ABR, KR) independently undertook analysis of the transcript document. The transcript was read and re-read by all three researchers in order to achieve immersion in the data [23], followed by identification and the highlighting of statements that appeared to clearly capture key thoughts and concepts relating to the phenomenon.

Transcripts were then re-read in order to capture the researchers' initial interpretations and subsequently to generate codes that were reflective of important emerging categories. A category related to qualitative content analysis can be defined as a mutually exclusive, internally homogeneous and externally homogeneous expression of the manifest content of several related units of analysis identified from the textual data [24]. Categories were named independently by each researcher initially using content-characteristic words [22], and subsequently discussed in order to achieve consensus upon the final coding and category scheme. A consensus was reached for 4 categories that emerged from the analysis, each with related sub-categories that were indicative of similar statements from participants regarding their footwear experiences. Coded units of analysis were assigned to the relevant sub-categories and frequencies of these assigned units were calculated in order to obtain a quantitative description for each category [26]. Excerpts from the transcript have been selected that represent both the truthfulness of the data and the most expressive articulation of each theme [27].

RESULTS

From the 185 original survey respondents, 91 (49%) responded to the open-ended question concerning footwear experiences of which 85 (46%) were usable responses. Demographic and clinical characteristics of these respondents are summarised in Table 1. A minimum of 9 chronic musculoskeletal diseases were represented by respondents, with the majority presenting with either RA (38%) or OA (58%). The sample population was typically aged over 45 years, with the majority of participants indicating that they had established disease greater than 1 year's duration at the time of survey completion. Respondents reported mild-to moderate foot pain as indicated by an overall mean (SD) score of 5.6 (2.6) on a 0-10 numerical rating scale. The majority of respondents had previously received orthotics/insoles

from a health professional (74%), and a minority or respondents (21%) had previously received therapeutic footwear.

Four categories encompassing a total of nine subcategories emerged from the qualitative data content analysis including: 1) difficulties in finding appropriate footwear; 2) dissatisfaction with therapeutic footwear provision and foot care access; 3) high costs of footwear, foot care and self-care; and 4) satisfaction with therapeutic footwear and foot care.

Difficulties in finding appropriate footwear

The responses expressing experiences of difficulties in finding appropriate footwear were organised into three subcategories concerning difficulties related to individual-level problems that were perceived as being related to respondents' chronic musculoskeletal disease and/or foot structure, the lack of available options with regards to desirable footwear design features and styles, and the burden experienced by people with chronic musculoskeletal disease through seeking to acquire appropriate footwear (Table 2). Statements concerning individual-level problems are outlined which attribute the difficulties with finding appropriate footwear being a consequence of respondents' foot shape. A significant proportion of respondents described experiences of shoes which would not accommodate their specific foot shapes, and disease-related foot symptoms such as tender/swollen joints, and stiffness in the feet. A number of respondents also expressed difficulties in finding appropriate footwear according to their preferences concerning desirable shoe designs, styles and features. Respondents emphasised the importance of simultaneously comfortable and smart/dress shoe options which were described as hard to come by. Some respondents highlighted that suitable footwear was available, but it is harder to find/access. Many respondents made reference to having to shop outside New Zealand or on the internet in order to find appropriate footwear.

Dissatisfaction with therapeutic footwear and foot care provision/access

Responses concerning experiences of dissatisfaction with therapeutic footwear and foot care access were organised into two subcategories according to whether or not the dissatisfaction was attributed to poor access to care, and/or dissatisfaction with the care that was provided (Table 3). A small proportion of respondents expressed that more or easier access to foot care was desired and/or required. A lack of referral access to foot care as well as dissatisfaction and frustration with delayed access to foot care was described. Several respondents expressed dissatisfaction and doubt about the orthotic devices that were prescribed to address their foot problems/provide relief. Some respondents perceived that their orthotic devices led to worsening of foot pain or expressed a lack of perceived benefit.

High costs of footwear, foot care and self-care

Responses concerning high costs were organised into two subcategories according to expressions concerning footwear and/or foot care (Table 4). The cost of shoes appeared to be a more important issue to respondents with many indicating that the most suitable shoes for them tended to be more expensive. Respondents expressed frustration with having to pay more for sensible shoes which were perceived as necessary due to their disease. Some respondents indicated that podiatric foot care access is expensive and some suggested that support should be provided to those with a clinical need for foot care. Several respondents described having received foot care in the past but have stopped seeking it due to being unable to afford it.

Satisfaction with footwear and foot care

Several respondents expressed satisfaction with footwear and foot care they had received and this category was organised into two separate subcategories to reflect this (Table 5). Respondents indicated that some footwear brands were suitable for them and resulted in some relief from symptoms or comfort, whereas some indicated that they were satisfied with the therapeutic footwear they had received. Satisfaction and relief was expressed as a result of obtaining suitable shoes. Other respondents mentioned that foot care predominantly in the form of orthotic provision resulted in satisfaction due to symptom relief or comfort.

DISCUSSION

The results of this study provide new qualitative data on the footwear experiences of people with chronic musculoskeletal diseases. Several key categories and sub-categories describing the important issues surrounding the footwear experiences of respondents emerged from the content analysis. This data largely corroborates previous findings with regards to the footwear experiences of people with RA [9-12], but also provides new and novel data concerning the experiences of those with other less frequently researched conditions in the context of footwear issues, particularly OA, SLE, gout and SSc. Interestingly, the results indicate that some footwear difficulties previously reported for people with RA appear to also be similarly experienced by people who have other chronic musculoskeletal diseases [9-12,17,19,20]. Therefore, this study has been successful in achieving its aims through the use of content analysis by generating a broad description of the phenomenon of footwear experiences in this sample population where such information was previously limited [23].

The majority of responses to the open-ended question were centred on footwear difficulties related to disease-related deformities, and a lack of desirable shoe features. The influence of foot deformities on footwear difficulties in people with RA has been previously reported and

as a result footwear considerations are included in foot specific patient-reported outcome measures [2,28]. We suggest that disease-related foot impairments such as pain, impairments and disability may also have an impact on the footwear experiences of people who have OA, gout, SSc, PsA or AS. The predominance of responses from people with OA that is an important finding as radiographic studies have reported a high prevalence of foot joint degeneration in older adults [29,30]. Degenerative OA changes in foot joints have been associated with changes in foot structure and function [31] which could explain some of the difficulties with finding appropriate footwear experienced by those with OA. Similarly foot pain, impairments and disability have been described in people with PsA [5], gout [4,17,18], SLE [7] and SSc [8]. An important finding of this study is that several respondents specifically described key desirable features of the shoes they have difficulty in obtaining to accommodate their foot problems. Respondents expressed frustration at insufficient width fittings and lack of half-size options. Respondents also indicated that arch supports should be integrated within a greater variety of shoe styles. The results of this study suggest that there may be a significant market need for footwear that is suitably designed for consumers who have chronic musculoskeletal diseases.

Recent research has found that footwear related pain is highly prevalent in women in the general population, and that there is a strong association between foot pain and ill-fitting footwear [32]. Moreover, footwear choices in younger women are driven predominantly by fashion and the self-image they want to portray [33]. We can postulate that women from the general population may be willing to persevere with fashionable but ill-fitting footwear that may be causing some mild foot pain. Whereas women who have disease-related foot pain and/or deformity may be less resilient or less willing to persist with such footwear due to the potential for increased levels of foot pain and discomfort. These findings are reflective of

past studies of people with RA and OA suggesting body image is an important factor in relation to perceptions of 'appropriate' footwear [10-12,19,34]. In contrast, a recent study of footwear choices in a predominantly male cohort with gout found that footwear choices were driven more by comfort, fit, and support [17]. We recommend that both the presence of individual foot problems as well as gender and personal preferences concerning footwear characteristics should be considered by the clinicians tasked with managing such problems.

A novel finding of this study was that many respondents with OA expressed difficulties in finding appropriate footwear. This may suggest that some respondents recognised the importance of sensible and well-fitting footwear, but found it difficult to locate through conventional means. A recent study has reported that a lack of available choice of retail footwear is problematic for women with RA, with several respondents in that study reporting having to rely predominantly on athletic footwear for comfort [10]. However the issue of people with chronic musculoskeletal diseases experiencing significant burden from seeking more appropriate footwear has not been previously described. Several respondents perceived that some brands not available to them in New Zealand possessed desirable characteristics such as extra wide fitting footwear. Whilst some respondents indicated that they would prefer to have more options for purchasing appropriate shoes online. Naidoo et al [10] reported that people with RA may experience frustration with seeking appropriate shoes from local retail outlets. Clinicians who work with patients who have musculoskeletal disease-related foot problems should be well placed to provide not only good personalised footwear advice in terms of desirable shoe features, but details of how and where to find such desirable shoe. Footwear advice is a recognised component of the overall management of foot disease in people with RA that is recommended in clinical practice guidelines [35], and footwear evaluation tools have recently been developed and validated for the assessment of the level of

appropriateness of patients' shoes [36]. However, an increased knowledge and awareness amongst clinicians delivering foot care of where and how patients can purchase appropriate shoes could facilitate more effective self-management and reduce some of the burden experienced by people with chronic musculoskeletal diseases.

Respondents expressed dissatisfaction with either access to, and/or care provided by specialist footwear and foot care services. Unmet needs and low provision of foot care have been reported in previous studies of people with RA [9,37], PsA [5], and JIA [6]. The best available evidence suggests that footwear interventions for those with RA and gout [13,18] and foot care interventions for people with RA, OA, gout, PsA, SSc, AS, and JIA [37-40] may be beneficial for the relief of foot pain. Despite of the evidence in support of foot care interventions, recent mixed-methods research has found that in the context of moderate to severe disease-related foot disability, people with RA in the state of New South Wales, Australia expressed significant dissatisfaction with foot care service access and provision [9]. Therefore the results of the current study suggest that this is not an isolated problem, and that there is significant room for improving access to footwear and foot care services for chronic musculoskeletal diseases in New Zealand.

We found that some respondents were satisfied with their footwear and foot care provision; however there were no apparent trends that may have been suggestive of respondents with one particular condition expressing greater satisfaction over another. Respondents indicated the importance of having their feet measured specifically for customised footwear to be provided, and responses were generally positive in this category concerning the shoes provided to accommodate different foot shapes/deformities. In terms of foot care, some

respondents focused predominantly on the positives of foot orthoses for reducing pain and improving posture, whilst others expressed dissatisfaction with their foot orthoses. Recent qualitative research has highlighted that the potential effectiveness of foot orthoses may be limited by patients' preferred footwear styles [41], and as such clinicians require expert knowledge of footwear issues and their potential impact on positive outcomes.

There is low-level evidence to support the use of foot orthoses for the relief of foot pain in people with RA [39-40] and JIA [38], however evidence supporting the use of foot orthoses in other chronic musculoskeletal diseases is generally lacking. Foot care interventions delivered as a package of care (complex intervention) have not been evaluated extensively using comparative effectiveness research. A retrospective observational study reported that 84% of patients who attended a new dedicated podiatric rheumatology service in Auckland, New Zealand reported that they were satisfied with the service they received [37]. A possible explanation for the frequent reports of satisfaction with this service may be due to the high levels of experience and specialist training for managing rheumatology-related foot problems that was undertaken by the podiatrists delivering care at this site. This highlights an issue with current foot care services, as recent research from the UK has suggested that there are large proportions of non-specialist podiatrists who are unaware of clinical practice guidelines for RA, and that there may be a lack of specialist podiatrists to meet the specific needs of the RA population [42,43]. Further training options and subsequent funding of specialist podiatrists may be required in order to improve access to and provision of foot care for people with chronic musculoskeletal diseases in New Zealand.

We found that respondents expressed concerns about the costs associated with appropriate footwear and the provision of foot care. This is an important finding in light of the results from the parent survey which suggests that 71% of respondents indicated that cost was a feature of importance when choosing footwear [21]. Previous studies report that arthritic conditions have a substantial impact on economic living standards [44,45]. The total financial costs of arthritis in New Zealand in 2010 are estimated to be $3.2 billion, or 1.7% of gross domestic product [46]. In addition, concerns with the high costs of foot care have been expressed previously by arthritis sufferers in Australia [9]. In the context of the major difficulties experienced by people with chronic musculoskeletal diseases in finding appropriate footwear in the first instance, the issue of high costs of suitable shoes once they have been found appears to be a major barrier to efficient self-care. Indeed only 42% of respondents to the open-ended question indicated that they were employed at the time of completion, suggesting that there may be an underlying socioeconomic barrier to being able to obtain appropriate footwear. The consequences of this problem appear to be that people with chronic musculoskeletal diseases in New Zealand typically wear footwear that can be described as inappropriate, characterised by poorly fitting shoes, poor shoe type (jandals/flip-flops, sandals, mules), lack of cushioning, lack of stability/support, shoes greater than 12 months old and excessive wear patterns [17,47]. The high levels of expense associated with appropriate footwear and foot care may be significant barriers to improvements in foot-related outcomes, as poor footwear has been associated with foot impairments and disability [1,11,17].

The main limitation to this study was that the open-ended nature of the question posed to respondents at the end of the primary electronic survey meant that interesting statements that were provided by respondents could not be followed up with further questioning for clarity

and/or further in-depth exploration. Indeed we could not follow up non-responders to determine whether or not they would have responded positively or negatively to this open-ended question. Another limitation that merits attention was that a significant proportion of respondents were people with RA or OA, with representation of other chronic musculoskeletal diseases being limited to generally less than 10 respondents. As such, the results of this study may be lacking external validity and therefore the ability to generalize these findings is restricted. Nevertheless, the high proportion of respondents with OA (58%) suggests that footwear experiences in this patient group may have been previously underestimated given that there is a scarcity of published OA footwear research available in the current literature relative to RA. It is acknowledged that whilst content analysis is useful for reducing text data into manageable summary categories [48,49], this approach has been criticised due to its reliance on researcher-driven coding schemes that may not accurately represent the respondent's meaning [50]. We attempted to minimise the potential for bias through the independent analysis of the transcript document by three experienced researchers. Minor disagreements on the final coding scheme were resolved through discussion between these three researchers.

In summary, the results of this study provide valuable preliminary qualitative data which will be useful for generating hypotheses for future studies concerning footwear difficulties, therapeutic footwear interventions, and footwear choices and wearing habits. The findings of this study will be of interest to clinicians who work with people who have chronic musculoskeletal diseases, to relieve symptoms by providing footwear advice and therapeutic footwear where required. Key categories describing the important issues surrounding the footwear experiences of respondents with chronic musculoskeletal diseases were identified

which may provide important targets for improving footwear and foot care services, and self-management strategies.

AUTHOR CONTRIBUTIONS

All authors were involved in drafting the article or revising it critically for important intellectual content, and all authors approved the final version to be submitted for publication. GJH conceived the study and all authors contributed to the design of the study. GJH, ABR and KR were responsible for independent qualitative content analysis.

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TABLES

Table 1. Participant demographic and disease characteristics.

	Men	Women	Total
Gender, no. (%)	9 (11)	76 (89)	85 (100)
Age groups, no. (%)			
26-35 years	1 (11)	3 (4)	4 (5)
36-45 years	1 (11)	6 (8)	7 (8)
46-65 years	1 (11)	39 (51)	40 (47)
66-75 years	4 (44)	20 (26)	24 (28)
over 75 years	2 (23)	8 (11)	10 (12)
Ethnicity, no. (%)			
Maori	0 (0)	3 (4)	3 (4)
European	9 (100)	67 (88)	76 (89)
Pacific Islander	0 (0)	2 (3)	2 (2)
Asian	0 (0)	4 (5)	4 (5)
Geographic location, no. (%)			
North Island	7 (77)	55 (72)	62 (73)
South Island	2 (23)	21 (28)	23 (27)
Employment status, no. (%)*			
Employed	1 (11)	35 (46)	36 (42)
Voluntary work	3 (33)	8 (11)	11 (13)
Unemployed	0 (0)	5 (7)	5 (6)
Retired	6 (66)	27 (36)	33 (39)
On a benefit	2 (22)	9 (12)	11 (13)
Musculoskeletal disease, no. (%)*			
Rheumatoid Arthritis	4 (44)	28 (37)	32 (38)
Gout	1 (11)	5 (7)	6 (7)
Systemic Scleroderma	0 (0)	1 (1)	1 (1)
Fibromyalgia	1 (11)	7 (9)	8 (9)
Lupus	0 (0)	4 (5)	4 (5)
Osteoarthritis	5 (56)	44 (58)	49 (58)
Juvenile Idiopathic Arthritis	0 (0)	1 (1)	1 (1)
Psoriatic Arthritis	0 (0)	5 (7)	5 (6)
Spondyloarthropathy	1 (11)	6 (8)	7 (8)
Other	1 (11)	9 (12)	10 (12)
Disease duration, no. (%)			
6 weeks to 6 months	0 (0)	1 (1)	1 (1)
6 months to 1 year	0 (0)	4 (5)	4 (5)
1-5 years	0 (0)	20 (26)	20 (24)
5-10 years	1 (11)	18 (24)	19 (22)
More than 10 years	8 (89)	33 (44)	41 (48)
Foot Pain NRS (0-10), mean (SD)	4.8 (3.6)	5.7 (2.5)	5.6 (2.6)
Insoles or orthotics prescribed by podiatrist or other healthcare professional, no. (%)	3 (33)	60 (79)	63 (74)
Has footwear from Orthotics Centre, no. (%)	4 (44)	14 (18)	18 (21)
Wears footwear from Orthotics Centre, no. (%)			
All the time	2 (50)	4 (28)	6 (33)
Occasionally	2 (50)	5 (36)	7 (39)
Never	0 (0)	5 (36)	5 (28)

*Please note that participants had the option of reporting more than one employment status and musculoskeletal disease

Table 2. Summary of subcategories and related frequencies of units of analysis for the main category 'Difficulties in finding appropriate footwear'.

Sub-category	Excerpts	Number of units
Footwear difficulties related to individual-level problems	"*I find difficulty finding shoes that are wide enough not to irritate my big and little toe joints*" [RA, female] "*There is much room for the producing of comfortable shoes for those with arthritis or similar foot problems*" [OA, male] "*I have a fused ankle on one leg so can't wear boots, shoes too high*" [SLE, female] "*I do have wide feet for a women and with having Lupus I won't injure them by putting them in ill-fitting shoes*" [SLE, female] "*Find me the right kind of shoe to suit my Maori feet, please*" [Gout, female]	36
Lack of desirable footwear design features and styles	"*It is nigh on impossible to find smart, comfortable low to medium-heeled shoes*" [OA, female] "*The shoe manufacturers do not appear to make half sizes much these days and it is very frustrating when you are a between size*" [PsA female] "*More footwear with ortho support built in like arch support should be available in sandals and sport shoes and dress shoes for women with easy access to put on and off the foot*" [OA, female]	35
Burden from seeking appropriate footwear	"*It's possible to find supportive sandals if you look hard*" [OA, female] "*It would be good to have recommendations where appropriate shoes could be purchased on line*" [RA, female] "*Some German brand shoes have wider fittings. Need availability in NZ. Also Mephisto a French brand are supposed to be great comfort again not available in NZ*" [RA, female] "*Even if I approached a shoes manufacture they do not have the last's available for this*" [OA, female]	13

Table 3. Summary of subcategories and related frequencies of units of analysis for the main category 'Dissatisfaction with therapeutic foot ware and foot care provision/access'.

Sub-category	Example	Number of units
Lack of, or delayed access to therapeutic footwear/foot care	"*Would love more access to specialised footwear and service*" [Fibromyalgia, female] "*What really annoys me about the health system is no health professional has referred me to a podiatrist*" [Fibromyalgia & RA, female] "*I have not been able to access the help I have needed in regards to foot care*" [OA & PsA, female] *"I did not access the orthotic centre until I was 67 when I consulted an orthopaedic surgeon"*[Gout, OA & AS female]	5
Dissatisfaction with therapeutic footwear/foot care provided	"*I have in the past had shoes or sandals with removable orthotics but took these out as they didn't seem necessary*" [RA, female] "M*y orthotics are too uncomfortable to wear for extended periods*" [RA, male] "*The prescribed orthotics created more pain and swelling*" [OA, female] "*Orthotic shoes do not seem designed/styled for those who work in a business suit dress code workplace*" [PsA, female] "*I found the podiatrist I visited to be unhelpful*" [OA, female] "*I need orthotics but am not sure the ones issued by the orthotic dept "off the shelf" are the best for me*" [OA, female]	8

Table 4. Summary of subcategories and related frequencies of units of analysis for the main category 'High costs of footwear and foot care.

Sub-category	Example	Number of units
Suitable shoes are expensive	"*I think people should be able to purchase comfortable shoes which do not cost a fortune*" [RA, female] "*Sandals that seem to suit me from the Shoe Clinic cost $200 and above*" [AS, female] "*Really good shoes for my feet are so expensive*" [OA, male] "*Cost is a factor when buying footwear*" [SLE & RA, female]	13
Foot care is expensive	"*Can the government offer some assistance on the cost of seeing a podiatrist? They are very expensive!"*[RA, female] "*My foot is really painful and has cost me a lot of money which is hard to afford*" [OA, RA and gout, female] "*In the past I had them measured and fitted by a podiatrist but can no longer afford that*" [OA, female] "*I had free podiatry overseas, but not in NZ*." [OA & AS, female] "*Seeing a Podiatrist should be free for people with arthritis*" [RA and OA, female]	8

Table 5. Summary of subcategories and related frequencies of units of analysis for the main category 'Satisfaction with footwear and foot care'.

Sub-category	Example	Number of units
Suitable footwear provides relief from symptoms	"*Only wear shoes from the shoe clinic who have my measurements*" [OA, female] "*Crocs are my most comfortable footwear*" [Fibromyalgia, female] "*I have to buy my shoes from my podiatrist, he stocks the Propet brand which, depending on the style, are usually wide enough and deep enough to accommodate orthotic*." [AS, female] "*I am very happy with the imported orthotic shoes I have been issued with from my local Orthotic Centre at the local hospital*" [Gout and OA, female]	8
Foot care provides relief from symptoms	"*I have custom made orthotics inserts to wear in my shoes, to help my posture*" [Fibromyalgia & RA, female] "*I went to orthotics NZ as a private patient and wearing them most of the time takes away some of the pain*" [RA, female] "*orthotics have provided best support for feet*" [RA, female] "*A corrective pattern in the orthotic helps to push back tissue/ bones tendons the way they should be. This was very helpful after inflammatory bouts and possibly may have cut down on the amount of oral pain relief I needed*" [PsA and OA, female]	6